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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
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09/000,330 05/20/98 NAKAMURA

EXAMINER

IM22/0112

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ART UNIT	PAPER NUMBER
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DATE MAILED:

01/12/00

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- ☒ Responsive to communication(s) filed on 12/6/99; 12/28/99
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-5 is/are pending in the application.
Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-5 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☒ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of Reference Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

-SEE OFFICE ACTION ON THE FOLLOWING PAGES-

1. The request filed on 6 December 1999 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/000,330 is acceptable and a CPA has been established. An action on the CPA follows.

2. The examiner acknowledges the addition of claim 5 set forth in Paper No. 9 filed 28 December 1999. Claims 1-5 are pending.

3. In Paper No. 9, applicant did not address the objections and rejections set forth in the Office action mailed 4 June 1999 (Paper No. 7). Hence, objections and rejections similar to those set forth in Paper No. 7 are set forth infra, in addition to the new objections and rejections.

4. The disclosure is objected to because of the following informalities:

1) The specification, at page 3, lines 5-6, and at page 5, line 9, discloses a polyolefin resin of a cyclic structure having an intrinsic viscosity of 0.25 dl/g or more, and a polyolefin resin of a cyclic structure having an intrinsic viscosity of less than 0.25 dl/g, respectively. Intrinsic viscosity refers to the limiting value at infinite dilution of the specific viscosity of a polymer, referred to its concentration. See page 621 of Grant & Hackh's Chemical Dictionary, fifth edition. Thus, the

intrinsic viscosity of a polymer appears to be dependent on the solvent in which the polymer is dissolved in and the temperature of the solution. The specification does not disclose the conditions under which the intrinsic viscosities are determined (e.g., solvent, temperature, etc.).

2) The specification, at page 3, lines 6-7, and at page 5, lines 10-11, discloses a polyolefin resin of a cyclic structure having a heat distortion temperature (HDT) by DIN53461-B of 70°C or higher, and a polyolefin resin of a cyclic structure having a heat distortion temperature (HDT) by DIN53461-B lower than 70°C, respectively. However, the specification does not define the standard DIN53461-B, nor the experimental conditions under which the HDT is determined. Furthermore, the specification does not disclose the date of the particular version of the standard that was used.

Appropriate correction is required.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claim 4, the recitation "polyolefin resin having a cyclic structure has a structure crosslinked by metal ions" lacks antecedent basis in the specification. Compare page 7, lines 11-

13, of the specification, which discloses that a polyolefin having a cyclic structure which has a carboxyl group is crosslinked by the addition of a metal. The specification does not disclose that the broadly recited polyolefin resin is crosslinked with a metal ion as recited in the instant claims.

In claims 4 and 5, if the term "dienes" in the phrase "polyolefin resin having a cyclic structure has a structure crosslinked by . . . dienes" refers to another compound, i.e., a diene crosslinking compound that is not part of the polymer, the phrase lacks antecedent basis in the specification. Compare page 7, lines 7-9, of the specification, which discloses that the polyolefin resin having a cyclic structure copolymerized with a diene monomer such as norbornadiene or cyclohexadiene can have a crosslinked structure.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and claims dependent thereon are indefinite in the phrase "heat roller type copier or printer" (emphasis added) because it is not clear what is the scope of the term "type." The specification does not define "heat roller type copier or printer." Compare page 1 of specification.

Claim 1 and claims dependent thereon are indefinite in the phrase "an intrinsic viscosity of 0.25 dl/g or more" because it is not clear what is the scope of said phrase. Neither the instant claims nor the specification defines the conditions under which the recited intrinsic viscosity is determined. See the discussion in item 1 of paragraph 4, supra.

Claim 1 and claims dependent thereon are indefinite in the phrase "a heat distortion temperature (HDT) by DIN53461-B of 70°C or higher" because it is not clear what is the scope of said phrase. The instant specification does not define the standard DIN53461-B. The instant specification does not disclose the conditions and criteria used in the standard used to determine the HDT, nor does it disclose the date or version of DIN53461-B. Standards can and do change over time: hence it is not clear what version of DIN53461-B was used, nor what version is intended in the claims.

Claim 1 and claims dependent thereon are indefinite in the phrase "binder resin at least includes a polyolefin resin having a cyclic structure, and a polyolefin resin of a cyclic structure

having an intrinsic viscosity is contained in a proportion of less than 50% by weight based on the entire binder resin" because it is not clear whether "a polyolefin resin of a cyclic structure having an intrinsic viscosity . . ." refers to the first recited polyolefin, or is necessarily another polyolefin.

Claim 2 is indefinite in the phrase "binder resin consists of 1 to 100 parts by weight of a polyolefin resin having a cyclic structure, and 0 to 99 parts by weight of at least one resin" (emphasis added) because it is not clear which polyolefin resin recited in claim 1 is the "a polyolefin resin having a cyclic structure" in claim 2.

Claim 2 is indefinite in the phrase "one resin selected from polyester resins, epoxy resins . . . styrene-acrylate resins, and other acrylate resins" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . . " or "R is . . . or . . . " MPEP 2173.05(h). Applicant is using a combination of both phrases. Hence, it is not clear what is the scope of the instant claims.

Claim 3 is indefinite in the phrase "said polyolefin resin having a cyclic structure has at least one functional group" because it is not clear which polyolefin resin recited in claim 1

must have the functional group (e.g., the first or second recited polyolefin resin).

Claim 3 is indefinite in the phrase "functional group selected from a carboxyl group, a hydroxyl group and an amino group" (emphasis added) for improper Markush language for the reasons set forth with respect to claim 2.

Claim 4 is indefinite in the phrase "said polyolefin resin having a cyclic structure has a structure crosslinked by metal ions or dienes" because it is not clear which polyolefin resin recited in claim 1 must have the crosslinked structure. The phrase is further indefinite because it is not clear whether the "dienes" are part of the polyolefin or are a separate compound.

Claim 5 is indefinite for the following reasons:

1) The phrase "an intrinsic viscosity of 0.25 dl/g or more" is indefinite for the reasons set forth with respect to claim 1, supra.

2) The phrase "a heat distortion temperature (HDT) by DIN53461-B of 70°C or higher" is indefinite for the reasons set forth with respect to claim 1, supra.

3) The phrase "binder resin at least includes 1 to 100 parts by weight of a polyolefin resin having a cyclic structure . . . a polyolefin resin of a cyclic structure having an intrinsic viscosity is contained in a proportion of less than 50%

by weight based on the entire binder resin" for the reasons set forth with respect to claim 1, supra.

4) The phrase "one resin selected from polyester resins, epoxy resins . . . styrene-acrylate resins, and other acrylate resins" (emphasis added) is indefinite for improper Markush language for the reasons set forth with respect to claim 2, supra.

5) The phrase "functional group selected from a carboxyl group, a hydroxyl group and an amino group" (emphasis added) for improper Markush language for the reasons set forth with respect to claim 2.

6) The phrase "cyclic structure of the polyolefin resin . . . is crosslinked by metal ions or dienes" is indefinite because it is not clear whether the "dienes" are part of the cyclic structure or are a separate compound.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Instant claims 1 and 5 recite a polyolefin having a cyclic structure that has "a heat distortion temperature (HDT) by DIN53461-B of 70°C or higher" and "an intrinsic viscosity of 0.25 dl/g or more." However, the instant specification does not disclose adequately how these experimental parameters are determined. The specification at page 3 merely discloses HDT by DIN53461-B and the recited intrinsic viscosity. The specification does not disclose what is DIN53461-B, nor what version or date of the standard was used. The specification does not disclose the experimental conditions under which the recited parameters were determined. Intrinsic viscosity refers to the limiting value at infinite dilution of the specific viscosity of a polymer, referred to its concentration. See page 621 of Grant & Hackh's Chemical Dictionary, fifth edition. Thus, the intrinsic viscosity of a polymer appears to be dependent on the solvent in which the polymer is dissolved in and the temperature of the solution. Furthermore, the organizations implementing the standard DIN53461-B have the authority to modify standards, so any connection the instant claims may have to this standard, as

recited, may vary over time. If the standard were to change, the disclosure would no longer support the claim limitations, and therefore the claim limitations would not be enabled. It would require undue experimentation for one of ordinary skill in the art to determine the experimental parameters needed to obtain the instant claimed numerical ranges.

10. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Instant claim 5 recites that the cyclic structure of the polyolefin resin has at least one functional group, which includes a carboxyl group, a hydroxyl group, or an amino group. Claim 5 further recites that the cyclic structure is cross-linked by metal ions or dienes. However, the originally filed specification does not provide an adequate written description of said polyolefin having a cyclic structure. The originally filed specification at page 6, line 36, to page 7, line 6, discloses that a carboxyl group can be introduced into the polyolefin resin having a cyclic structure by the melt air oxidation method or modification with maleic anhydride. The specification further discloses that a hydroxy group or an amino group can be

introduced by known methods. The originally filed specification at page 7, lines 7-13, discloses that the polyolefin resin having a cyclic structure can be crosslinked by copolymerizing the polyolefin resin having a cyclic structure with a diene monomer such as norbornadiene or cyclohexadiene, or by introducing a crosslinking structure into the polyolefin resin of a cyclic structure, which has a carboxyl group introduced therein, by adding a metal such as zinc, copper or calcium. The originally filed specification does not disclose that the functional group is introduced in the cyclic structure, nor that the cyclic structure that has a functional group as recited in the instant claims is crosslinked by metal ions or by other compounds comprising dienes, as recited in the instant claim.

11. The recitation that the second recited polyolefin resin having a cyclic structure that has the recited intrinsic viscosity, molecular weight and HDT in claims 1 and 5 "is contained in a proportion of less than 50 % by weight based on the entire binder resin" reads on "zero weight percent." In other words, the second recited polyolefin need not be present in the toner. This reading is consistent with the "inventive" examples of the specification. The examples 1, 3, 4, 6-8, 10-18 and 20-27, which are labeled inventive, comprise toners that contain only one polyolefin having a cyclic structure; however,

these polyolefins do not have the intrinsic viscosity, molecular weight and heat distortion temperature recited in instant claims 1 and 5. Rejections made in view of this reading of claims 1 and 5 follow infra.

12. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 58-149060 (JP'060) (see PTO translation for cites).

JP'060 discloses a toner that comprises a colorant, carbon black, a charge controlling agent, and a binder resin that comprises a polyolefin resin having a cyclic structure, polynorbornene, and a styrene-acrylate resin. JP'060 discloses that the toner is effectively fixed by a heating roller without causing offsetting even when a fixed roller is not fed a releasing solution. Translation, Working Example 2 at pages 11-12.

13. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 63-191817 (JP'817) (see the PTO English translation for cites).

JP'817 discloses a toner that comprises a colorant, carbon black, a charge controlling agent, and a binder resin that comprises a styrene-n-butylmethacrylate copolymer resin and a polyethylene grafted with a styrene monomer and an unsaturated

carboxylic acid ester monomer. PTO translation, page 15, lines 1-5; example 1. JP'817 discloses that the toner provides clear fixed copied images without the accompanying offset phenomenon and contamination, after 5000 copies. PTO translation, page 19.

The instantly recited "polyolefin having a cyclic structure" reads on the polyethylene grafted with a styrene monomer disclosed by JP'817.

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'817 (see the PTO translation for cites).

JP'817 discloses a toner as described in paragraph 13 above, which is incorporated herein by reference.

JP'817 does not exemplify a polyolefin that has at least one carboxyl group as recited instant claim 3. However, JP'817 discloses that the polyethylene grafted styrene can be further grafted with an unsaturated carboxylic acid monomer, such as acrylic acid or methacrylic acid. PTO translation, page 9, lines 24-26. JP'817 discloses that said polyethylene grafted with styrene and an unsaturated carboxylic acid monomer is equivalent to those exemplified grafted polyethylenes in providing toners that have excellent mold-releasing ability and storage stability. PTO translation, page 5, lines 20-26.

It would have been obvious for one of ordinary skill in the art, in view of the teachings of JP'817, to use a polyethylene

grafted with styrene and an unsaturated carboxylic acid monomer in the toner of JP'817, because one would have had a reasonable expectation of successfully obtaining a toner having the benefits disclosed by JP'817.

15. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by US 5,650,254 (Eguchi).

Eguchi discloses a toner that comprises a colorant, a charge controlling agent, and a binder resin that comprises a styrene-butylacrylate copolymer resin and a polyethylene grafted with a styrene monomer and an unsaturated carboxylic acid ester monomer. Eguchi, Examples 1-5.

The instantly recited "polyolefin having a cyclic structure" reads on the polyethylene grafted with a styrene monomer disclosed by Eguchi.

16. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,324,616 (Sacripante) combined with the Handbook of Imaging Materials, page 169.

Sacripante discloses a heat fusible encapsulated toner that comprises a core that comprises colorant and a binder resin that comprises a polyolefin having a cyclic structure, such as polynorbornene. Sacripante, col. 7, line 56, to col. 8, line 15; examples I to VIII. Sacripante further discloses that the

polyolefin having a cyclic structure can be obtained by polymerizing "hydroxy nornbornene" [sic], which meets the limitations of claim 3. Sacripante, col. 7, line 63-64, reference claim 7.

Sacripante does not disclose that the toner comprises a charge controlling agent. However, the use of a charge controlling agent is well-known in the art. The Handbook of Imaging Materials, at page 169, discloses that it is known to add charge control additives to toners when the pigment blended into the polymer resin does not give an adequate charge level or rate of charging. The Handbook further discloses a number of known charge control agents, such as nigrosine, and metal complexes, that are effective at giving the toner a positive or negative charge.

It would have been obvious to one of ordinary skill in the art, in view of the teachings of the Handbook of Imaging Materials, to add a charge control agent to the toner disclosed by Sacripante, because one would have had a reasonable expectation of successfully obtaining a positively or negatively charged toner that has an adequate charge level and rate of charging.

17. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 2-184864 (JP'864) (see PTO translation for cites).

JP'864 discloses a toner that comprises a colorant and a binder resin that comprises a polyolefin resin having a cyclic structure, a cyclopentadiene polymer. JP'864 discloses that the cyclopentadiene polymer can be obtained from dicarboxy diallyltricyclo(5,2,1,0²⁶)decane, or dicarboxy diallylpentacyclo(6,5,1,1³⁶,0²⁷,0⁹¹³) pentadecane. JP'864 discloses that since the cyclopentadiene polymer has a large number of allyl groups, the allyl groups can readily undergo a polymer radical reaction. Thus, the toner can be fixed by ultraviolet-cure. In other words, the cyclopentadiene polymer can be crosslinked. JP'864 discloses that the toner provides toner images with increased density, and has good resolving power and fixing. Translation, page 2, lines 8-14; page 4, lines 17-25; page 5, lines 16-25; Working Examples 8-24 at pages 20; and JP'864, page 631.

JP'864 does not exemplify a toner that comprises a charge controlling agent. However, JP'864 discloses that a polarity-controlling agent can be incorporated in its toner. Translation, page 6, lines 21-22. The use of a charge controlling agent is well-known in the art. The discussion of the Handbook of Imaging

Materials in paragraph 16 above is incorporated herein by reference.

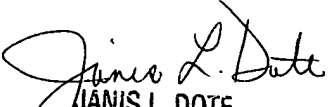
It would have been obvious to one of ordinary skill in the art, in view of the teachings of the Handbook of Imaging Materials, to add a charge control agent to the toner disclosed by JP'864, because one would have had a reasonable expectation of successfully obtaining a positively or negatively charged toner that has an adequate charge level and rate of charging.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (703) 308-3625.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599 for after final faxes, and (703) 305-7718 for other official faxes.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JLD
January 11, 2000


JANIS L. DOTE
PRIMARY EXAMINER
GROUP 1500
1700